building is always greater than it is on the lower floors. The increase of the pressure in the case of gas is the inverse of that which occurs with water.

In *Hutte,* in the chapter upon illuminating gas, the following statement occurs: " A rise (or a drop) of 10 m in height in the mains corresponds to an increase (or a loss) in pressure in the neighborhood of 7 mm of water column." <X)

The following rule, to be followed in the location of a gas works is given in order that there may be a uniform pressure in the holder and throughout the distributing system: " The gas works, should be installed at the lowest point in the system and should be so located that the highest point in the supply system is furthest from the works, and the lower parts are closer to the works; under such conditions the loss of gas pressure due to friction in the mains is compensated for by the increase of the hydrostatic pressure in the piping, in proportion to its distance from the works and its elevation above their level/[7]

The existence of hydrostatic pressure in the gas having been established, it is now possible to take into exact account those phenomena which are presented in metallurgy.

(a) The Draft Fallacy of Metallurgical Furnaces. —It was believed for a long time that furnaces having a natural current of air through them operated through the effect of their chimneys. This is an error due to a poor interpretation of the facts. One of the first principles which must never be forgotten is that the only furnaces which operate by the draft provided by the chimney are those which have no working doors or openings for the charging of material to be heated. Furnaces of this sort include boilers, entirely enclosed in a setting built of brick or other material, crucible melting furnaces which are very nearly hermetically closed up, iron tube air heaters (formerly used for heating the air at

blast furnaces), the Cowper hot blast stove, etc.

Furnaces which have working doors to their laboratories or heating chambers, such as reverberatory furnaces, melting furnaces, puddling furnaces, brick kilns, Siemens furnaces of all kinds (open-hearth and others), do not operate by the draft of the chimney. The chimney connected with these furnaces is only an apparatus for removing the products of combustion from the laboratory. The colossal chimneys which are very often seen are

[C1)] Vol. II, p. 869, French edition of 1911.